INSTRUCTIONS

GERMANIUM DIODE CHECKER

TYPE ST-12A

EBI-7028

ELECTRONICS DIVISION
GENERAL ELECTRIC COMPANY
ELECTRONICS PARK, SYRACUSE, N. Y.

7/52 (250)

Printed in U.S.A.

OPERATING PRECAUTIONS

When the lever switch is held to the INVERSE position, voltages near 120 volts may be across the test clips. A spring return has this switch normally on FORWARD with less than 2 volts across the clips.

USER WARRANTY

The General Electric Company warrants to the ultimate purchaser for use of the new General Electric Germanium Diode Checker, Type ST-12A, that any part thereof (except electronic tubes incorporated therein which are covered by the Company's standard tube warranties) which proves to be defective in material or workmanship within ninety (90) days from the date of original purchase for use will be repaired or replaced. Any defect in said Germanium Diode Checker, Type ST-12A, should be brought to the attention of the dealer from whom it was purchased, who shall be authorized to furnish or arrange for repairs or replacements within the terms of this warranty.

The foregoing is in lieu of other warranties, express or implied and the General Electric Company neither assumes, nor authorizes any person to assume for it, any other obligation or liability in connection with said Germanium Diode Checker, Type ST-12A.

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the General Electric Company.

GENERAL SERVICE INFORMATION

SAFETY NOTICE

WARNING

VOLTAGES USED FOR THE OPERATION OF THIS EQUIPMENT ARE DANGEROUS TO HUMAN LIFE.

This instruction manual is written for the general guidance of maintenance and service personnel who are familiar with and aware of the dangers of handling electric and electronic circuits. It does not purport to include a complete statement of the safety precautions which should be observed in servicing this or other electronic equipment. The servicing of this equipment by inadequately trained or inexperienced personnel involves risks to such personnel and to the equipment for which the manufacturer can not accept responsibility. Personnel servicing this equipment should familiarize themselves with first-aid treatment for electrical burns and electrical shock.

PRODUCTION CHANGES

From time to time it becomes necessary to make changes in the equipment described in this book. Such changes are made to improve performance or meet component shortages and are identified by a revision letter following the model number stamped on the nameplate. The changes in the equipment as they affect the instruction book are listed on a Production Change Sheet included in the book. If no Production Change Sheet is included, no changes have been made. The revision letter appearing on the title page indicates the equipment revision to which the book corresponds.

This information is provided as a servicing aid; it should not be used to modify earlier equipments to incorporate later revisions except under specific instructions. Please mention the revision letter in any correspondence.

REPLACEMENT PARTS

The parts list contained in this book includes all principal replacement parts. The symbol numbers are the same as those appearing on elementary and other drawings. Whenever possible, replacement parts should be obtained from a local electronics supply dealer. If it is necessary to order a part (other than a tube) from the General Electric Company, please include the symbol number, description, and drawing number of the part and model number of the unit. Orders may be sent to the nearest Electronics Division office appearing on the list at the end of this book or the General Electric Company, Technical Products-Communication Products Department, Electronics Park, Syracuse, N.Y.

REPLACEMENT TUBES

In all cases replacement tubes must be ordered from a local tube distributor.

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the General Electric Company.

DEFENSE ELECTRONICS DIVISION

GENERAL ELECTRIC

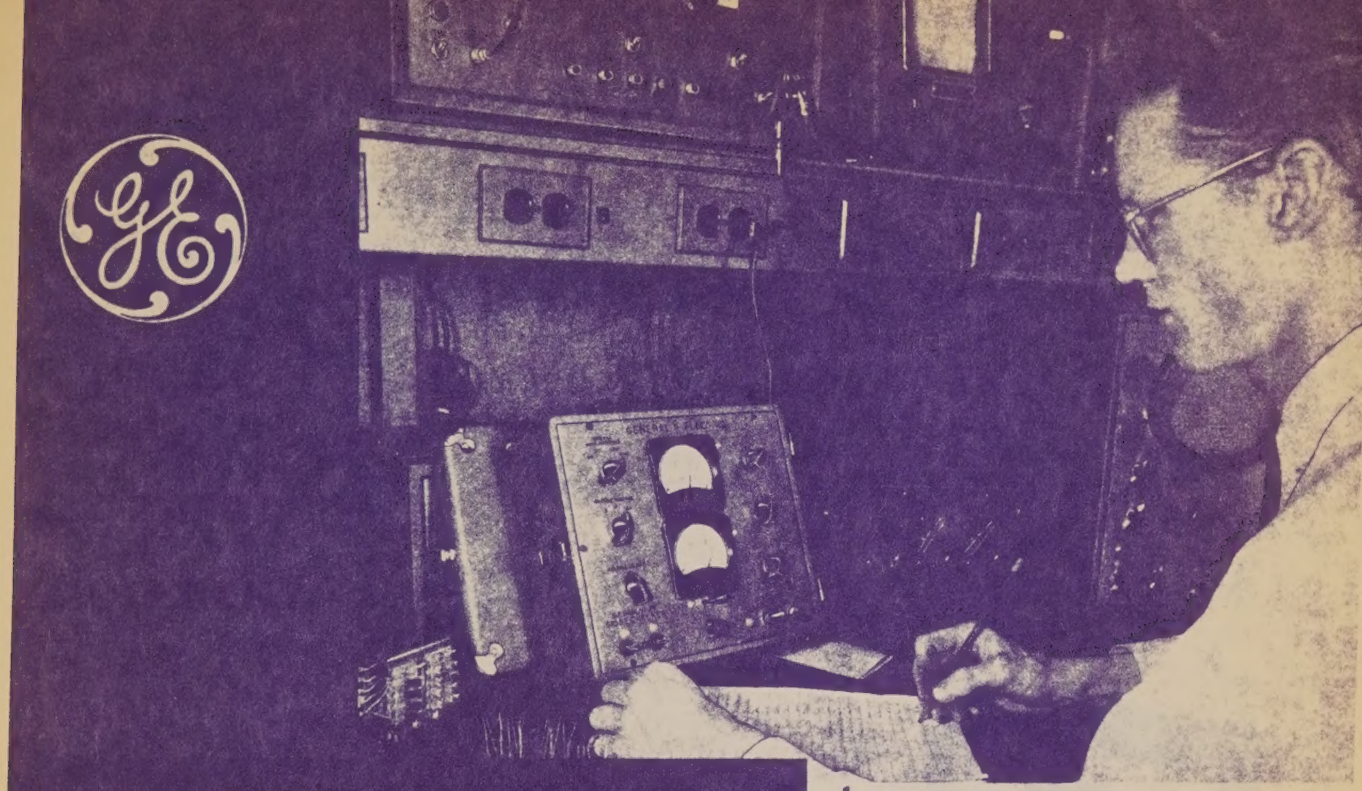
ELECTRONICS PARK, SYRACUSE, N. Y.

EBI-17B 3/62 (10M)

PRINTED IN U.S.A.

WARRANTY

The General Electric Company (hereinafter called the Company) warrants to the Purchaser that the equipment will be free from defects in material, workmanship, and title, and will be of the kind and quality designated or described in the contract. The foregoing warranty is exclusive of all other warranties whether written, oral, or implied (including any warranty of merchantability or fitness for purpose). If it appears within one year from the date of shipment by the Company that the equipment described in this instruction book does not meet the warranties specified above and the Purchaser notifies the Company promptly, the Company shall thereupon correct any defect, including non-conformance with the specifications, at its option, either by repairing any defective part or parts or by making available at the Company's plant, a repaired or replacement part. In lieu of the foregoing, the standard published tube warrranties in effect on the date hereof shall apply to new electronic tubes. If the equipment is installed, or its installation supervised, by the Company, said one year shall run from the completion of installation provided same is not unreasonably delayed the Purchaser. The conditions of any test shall be mutually agreed upon and the Company shall be notified of and may be represented at all tests that may be made. The liability of the Company to the Purchaser (except as to title) arising out of the supplying of the said equipment, or its use, whether on warranty, contract or negligence, shall not in any case exceed the cost of correcting defects in the equipment as herein provided and upon the expiration of said one year, all such liability shall terminate. The foregoing warranty does not apply to any used equipment supplied under contract or any equipment supplied under contract which bears a trademark of a manufacturer other than that of the Company. Because of the more restrictive warranties expressed by other manufacturers, the Company under contract can only make available to the Purchaser the warranty of the manufacturer on all such equipment. The Company will secure for the Purchaser at his request copies of the manufacturer's standard published warranty applicable to all such equipment. Used equipment is sold as is without warranty unless otherwise specifically provided in writing in the sales contract. The foregoing shall constitute the sole remedy of the Purchaser and the sole liability of the Company.



GERMANIUM DIODE CHECKER

Type ST-12A

The General Electric Germanium Diode Checker, Type ST-12A, is a high quality, precision-engineered, portable instrument designed for use in laboratories, quality control groups, service shops and wherever there is a need for checking the static characteristics of germanium diodes.

Extremely versatile in design, the ST-12A has two sets of test clips: one for diodes with leads, and the other for diodes with a pin on each end. The circuit has been designed to prevent instrument damage, in the event the test clips are shorted on any range.

The diode resistance is checked by placing a variable, accurately-metered DC voltage across the diode and reading the resulting current on a second meter. The Forward and Inverse circuits are entirely separate, so a diode may be tested to be sure it meets the manufacturer's test limit in both the forward and back direction by simply moving a lever switch, thus eliminating both reversal of the diode in the clips and any major readjustment of controls.

For ready reference, a chart giving manufacturers' limits for approximately forty of the diodes most commonly encountered is secured in the cover of the ST-12A.

In addition to testing germanium diodes, this instrument also has numerous other applications, a few of which are:

- General resistance checker (10 ohms to 6 megohms)
- Accurately-metered power supply
- Forming electrolytic capacitors and checking DC leakage current

GENERAL ELECTRIC

ELECTRICAL SPECIFICATIONS

POWER REQUIREMENTS

105-125 volts, 50/60 cycle, approximately 10 watts

FORWARD RANGES*

Current—0.3, 1.2, 6 and 12 milliamperes full scale
Voltage—.3 and 1.2 volts full scale

INVERSE RANGES*

Current—60, 120, 300 and 1200 microamperes full scale
Voltage—3, 12 and 120 volts full scale

*A three-inch voltmeter and a three-inch current meter are used. Thus, the voltage and current can be metered simultaneously. All voltage ranges are continuously variable.

ACCURACY

Instrument movements—within ± 2%
Associated circuit—within ± 4% (on commercially available diodes at their specified limits)

AMBIENT TEMPERATURE

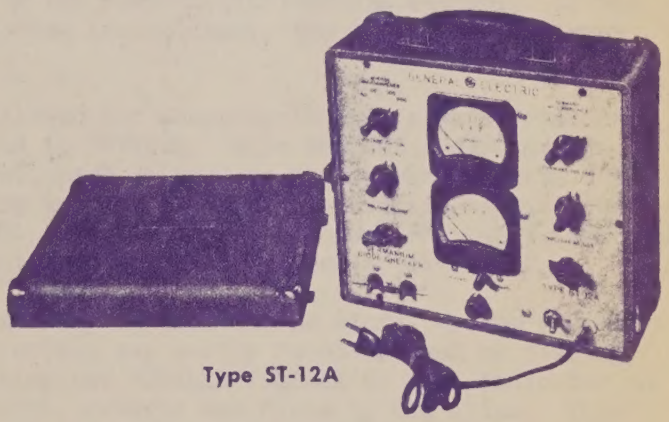
0 to 40° C

TUBE COMPLEMENT

6X4

MECHANICAL SPECIFICATIONS

Height	10 inches
Width	11 inches
Depth	6 inches
Weight	8 pounds



Type ST-12A

SCOPE OF SPECIFICATIONS

In the construction of the equipment described, the full intent of the specifications will be met. The General Electric Company, however, reserves the right to make any departure from the specification for reasons of improved design.

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GERMANIUM DIODE CHECKER

TYPE ST-12A

OPERATION

The forward characteristics of a germanium diode may be checked immediately after turning the unit on as no warm-up is needed. Place the diode in the proper set of clips with the arrow in the same direction as the arrow on the panel. (Two sets of clips are provided to accomodate diodes of different lengths.) If the diode is marked with plus and minus sign only, this is the same as an arrow pointing from plus to minus. On the diode chart find the forward test limits for the diode being checked and set the FORWARD VOLTAGE control to the proper scale. With VOLTAGE ADJUST set chart voltage on the meter and read the resulting forward current on the scale selected by the FORWARD MILLIAMPERES control. If the current is less than that indicated in the chart, the diode does not meet the manufacturer's test limit.

A similar procedure is followed for checking inverse characteristics except lever switch must be held to INVERSE. With VOLTAGE ADJUST on the left-hand side of the panel, set chart voltage on the correct INVERSE VOLTAGE scale and read the resulting inverse current on the scale selected by the INVERSE MICROAMPERES control. If the current is more than that indicated in the chart, the diode does not meet the manufacturer's test limit.

If a different method of marking is used on the diode, or the marking is not legible, the forward direction may easily be determined by placing the diode in the clips and setting the FORWARD VOLTAGE to that indicated on the chart. If there is no current, reverse the diode in the clips. This will give a forward current reading unless the diode is open.

The complete inverse characteristic curves may be checked from 0 - 120 volts. The forward measuring circuit is independent from the inverse circuit. The circuit design permits the diode to short without harm to the meters.

MAINTENANCE

R34 is adjusted at the factory to balance the bridge circuit with nothing in the test clips. This internal adjustment can best be made on the 0.3 FORWARD MILLIAMPERE range and FORWARD VOLTAGE set at 1.2 volts meter reading. Adjust R34 for zero current.

PARTS LIST

This list includes all principal replacement parts. The symbol numbers used are the same as those appearing on elementary and other diagrams. When ordering a replacement part, please include description, symbol designation, and reference number of the part and model number of the equipment. Orders may be sent to the nearest General Electric office or to the General Electric Company, Commercial Equipment

Symbol	Description	G-E Drawing
	CAPACITORS	
*C1	Electrolytic, 4 mfd +100 -0%, 250 v d-c w. Cornell Dubilier Type BRB425.	P-7768109-P99
*C2	Electrolytic, 1500 mfd, 6 v. Pyramid Type TD-1500-6.	
	RECTIFIERS	
*CR1 and CR2	Selenium rectifiers: max d-c output 75 ma, max RMS volts 20. Federal Telephone and Radio Cat. 1001.	M-7480225-P6
	FUSE	
*F1	2/10 amp, 250 v, Type 3AG slow blow. Bussman Cat. #MDL-2/10.	
	JACKS AND RECEPTACLES	
*J1 thru J4	Test clip, panel mount. Grayhill Type #2-0.	
	METERS	
M1	Voltmeter.	
M2	Current meter.	

*This item or equivalent should be obtained from a local radio dealer.

Symbol	Description	G-E Drawing
	RESISTORS	
R1	Inverse Voltage Adjustment Triple Potentiometer. Includes R1A, B, and C.	
R1A	25,000 ohms ± 10%, 4 w. Part of R1.	
R1B	2000 ohms ± 10%, 3 w. Part of R1.	
R1C	600 ohms ± 10%, 3 w. Part of R1.	
*R2	Composition, 12,000 ohms ± 10%, 1/2 w. Jan Type RC20BF123K.	
*R3	Composition, 47,000 ohms ± 10%, 1/2 w. Jan Type RC20BF473K.	
*R4	Composition, 0.15 megohm ± 10%, 1/2 w. Jan Type RC20BF154K.	
*R5	Composition, 0.33 megohm ± 10%, 1/2 w. Jan Type RC20BF334K.	
*R6	Composition, 1000 ohms ± 10%, 1/2 w. Jan Type RC20BF102K.	
*R7	Composition, 8200 ohms ± 10%, 1/2 w. Jan Type RC20BF822K.	
R8	Composition, 24,000 ohms ± 5%, 1/2 w. Jan Type RC20BF243J.	
*R9	Composition, 560 ohms ± 10%, 1/2 w. Jan Type RC20BF561K.	
*R10	Composition, 3300 ohms ± 10%, 1/2 w. Jan Type RC20BF332K.	
*R11	Carbon film on ceramic, 150 ohms ± 1%, 1/2 w.	C-7707244-P446
*R12	Carbon film on ceramic, 450 ohms ± 1%, 1/2 w.	C-7707244-P454
*R13	Carbon film on ceramic, 900 ohms ± 1%, 1/2 w.	C-7707244-P463
*R14	Carbon film on ceramic, 1500 ohms, 1%, 1/2 w.	C-7707244-P467

*This item or equivalent should be obtained from a local radio dealer.

Symbol	Description	G-E Drawing
	RESISTORS (CONT.)	
R15	Carbon film on ceramic, 14,570 ohms ± 1%, 1/2 w.	
*R16	Carbon film on ceramic, 60,000 ohms ± 1%, 1/2 w.	C-7707244-P499
*R17	Carbon film on ceramic, 0.60 megohm ± 1%, 1/2 w.	C-7707244-P520
*R18	Composition, 10 ohms ± 10%, 1/2 w. Jan Type RC20BF100K.	
*R20	Forward Voltage Adjust. Potentiometer, wirewound: 50 ohms ± 10%, 2 w, linear taper.	M-2R72-P10
*R21	Composition, 10 ohms ± 10%, 1/2 w. Jan Type RC20BF100K.	
*R22	Carbon film on ceramic, 2000 ohms ± 1%, 1/2 w.	C-7707244-P469
R23	Carbon film on ceramic, 1065 ohms ± 1%, 1/2 w.	
R24	Carbon film on ceramic, 5565 ohms ± 1%, 1/2 w.	
R25	Carbon film on ceramic, 667 ohms ± 1%, 1/2 w.	
R26	Carbon film on ceramic, 111 ohms ± 1%, 1/2 w.	
R27	Carbon film on ceramic, 20.4 ohms ± 1%, 1/2 w.	
R28	Carbon film on ceramic, 10.1 ohms ± 1%, 1/2 w.	
R29	Carbon film of ceramic, 667 ohms ± 1%, 1/2 w.	
R30	Carbon film on ceramic, 111 ohms ± 1%, 1/2 w.	
R31	Carbon film on ceramic, 20.4 ohms ± 1%, 1/2 w.	
R32	Carbon film on ceramic, 10.1 ohms ± 1%, 1/2 w.	
R33	Composition, 1300 ohms ± 5%, 1/2 w. Jan Type RC20BF132J.	
*R34	Bridge Balancing. Potentiometer, wirewound: 500 ohms ± 10%, 2 w, linear taper.	M-2R72-P57

*This item or equivalent should be obtained from a local radio dealer.

Symbol	Description	G-E Drawing
	SWITCHES	
*S1	Power Switch. Toggle type, spst, 3 amp at 250 v. Arrow Hart and Hegeman Type 20994-WJB.	M-7478623-P1
S2	Inverse Current Switch. Rotary type, 4 pole, 4 positions.	
S3	Inverse Voltage Switch. Rotary type, 2 pole, 3 positions.	
*S4	Forward Voltage Switch. Rotary type, 2 positions, dp, nonshorting type contacts. Centralab Type 1464.	K-112J201-P1
*S5	Inverse Forward Switch. Lever type, 6 pole, 2 positions, nonshorting type contacts. Mallory Cat. #7262-L.	
S6	Forward Current Switch. Rotary type, 2 pole, 4 positions.	
	TRANSFORMER	
T1	Power transformer.	
	TUBE	
V1	Rectifier. Type 6X4.	
	SOCKETS	
*XF1	Fuse holder. Bussman Type HKP.	K-7115179-P1
*XV1	Tube socket: miniature, 7 pin, bottom mounted, flat top.	P-7768887-P3
	MISCELLANEOUS PART	
	Chart, diode.	

*This item or equivalent should be obtained from a local radio dealer.

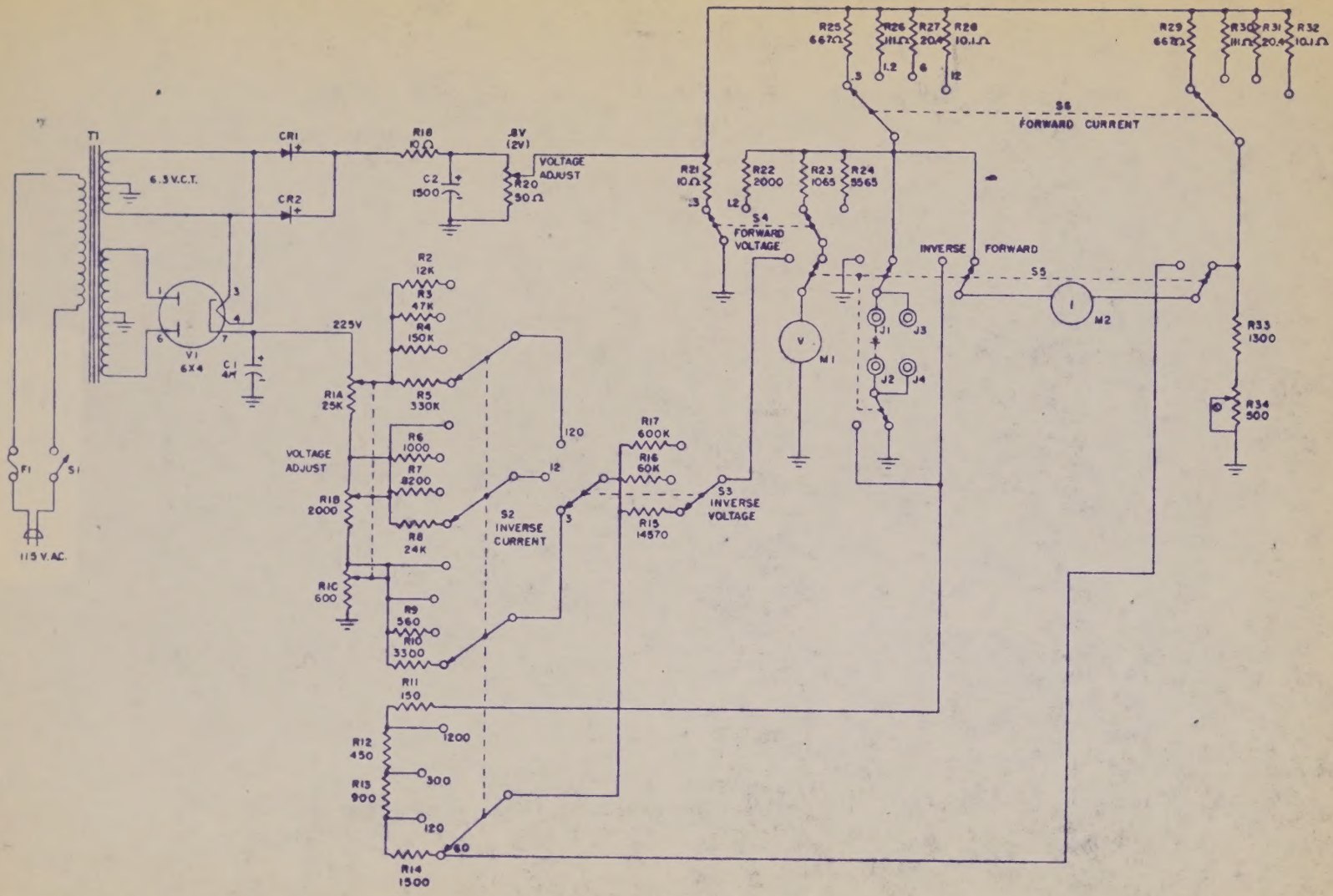

Fig. 1 Elementary Diagram, Type ST-12A Germanium Diode Checker (C-7774521, Rev. 0)

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